AMENDMENTS TO THE CLAIMS

Claims 1-16 (Cancelled)

- 17. (New) A method for the preparation of an olefin polymer having a ratio of internal to terminal double bonds of at least 1:1 comprising:
- (a) providing a catalyst system comprising a metallocene catalyst component characterized by the formula:

R''(Cp)(Cp')(MQp)

wherein:

Cp comprises a substituted cyclopentadienyl group having at least one substituent on the cyclopentadienyl group which is positioned at a location distal to the bridge;

(Cp') comprises a fluorenyl group which is unsubstituted or substituted at at least one of the three and six positions of said fluorenyl group;

R" comprises a structural bridge imparting stereo rigidity to the catalyst component;

M is a metal atom from Group IVB, VB or VIB of the periodic table; Q is a hydrocarbon group having from 1 to 20 carbon atoms or is a halogen, and P is an integer equal to the valance of M minus 2;

- (b) contacting said catalyst system in a reaction zone with at least one olefin monomer which is present in a diluent in a concentration of less than 3 mol/L, under polymerization conditions at a temperature within the range of 20-90 °C effective to polymerize said olefin monomer to provide a polyolefin having a ratio of internal to terminal double bonds of at least 1:1; and
 - (c) recovering said polyolefin from said reaction zone.

2

- 18. (New) The method of claim 17 wherein said olefin monomer comprises ethylene or propylene wherein said olefin polymer is a polyethylene homopolymer or copolymer, or a polypropylene homopolymer or copolymer.
- 19. (New) The method of claim 18 wherein said olefin monomer comprises ethylene and said polymer is an ethylene homopolymer or an ethylene copolymer.
- 20. (New) The method of claim 19 wherein said ethylene monomer is contacted with said catalyst system along with a comonomer of butene or hexene to produce an ethylene copolymer.
- 21. **(New)** The method of claim 18 wherein said monomer comprises propylene and said polymer is a polypropylene homopolymer.
- 22. (New) The method of claim 17 wherein said fluorenyl group Cp' is substituted with at least one substituent in at least one of the 3 and 6 positions and said cyclopentadienyl group Cp is substituted with a substituent which is bulkier than the substituent on the fluorenyl group.
- 23. (New) The method of claim 17 wherein said cyclopentadienyl group Cp is substituted at the distal position with a substituent selected from the group consisting of n-Pr, i-Pr, n-Bu, t-Bu and Me₃Si.
 - 24. (New) The method of claim 23 wherein said fluorenyl group Cp' is unsubstituted.

- 25. (New) The method of claim 23 wherein said fluorenyl group Cp' is symmetrically substituted with a substituent which is less bulky than the distal substituent of the cyclopentadienyl group Cp.
- 26. (New) The method of claim 25 wherein said fluorenyl group Cp' is substituted at the 3 and 6 positions.
- 27. (New) The method of claim 17 wherein said R" is selected from the group consisting of an isopropylidene group, a diphenyl methylene group, an ethylene group, and a dimethyl silyl group.
- 28. (New) The method of claim 27 wherein said metallocene catalyst component comprises an isopropylidene (3t-BuCp) (fluorenyl) ligand structure.
- 29. (New) The method of claim 17 wherein said polymerization is carried out to provide a polyolefin having a ratio of internal to terminal double bonds of at least 2:1.
- 30. (New) The method of claim 17 further comprising reacting said polyolefin produced in subparagraph (b) to produce a nonlinear polyolefin.
- 31. (New) The method of claim 30 wherein said nonlinear polyolefin is a cross-linked polyolefin.
- 32. (New) The method of claim 30 wherein said nonlinear polyolefin exhibits long chain branching.
- 33. (New) The method of claim 17 wherein the polyolefin recovered from said reaction zone in subparagraph (c) is transferred to a second reaction zone in series with said first

reaction zone and further comprising reacting the said polyolefin in said second reaction zone to produce a nonlinear polyolefin.

- 34. **(New)** The method of claim 33 further comprising functionalizing said polyolefin in said second reaction zone by the reaction of said polyolefin with a functionalizing agent in said second reaction zone.
- 35. (New) The method of claim 34 wherein said functionalizing agent introduces polar groups at internal double bonds of said polymer.
- 36. **(New)** The method of claim 35 wherein said polar groups are selected from the group consisting of carboxylic acid groups, acrylic groups, acrylate groups and carboxylic acid ester groups.